

Appendix B.2

**Transmission Line and Substation
General Specifications**

Table B.2-1. Electrical Design Characteristics of the 500kV AC Transmission Line

General Overview				
	Self-Supporting Steel Lattice	Guyed V Steel Lattice	Self-Supporting Steel Tubular	Guyed Delta Steel Lattice
Line Length	400-430 Miles			
Voltage	500kV			
Maximum Transfer Capacity	1,600 MVA (1500 MW) – <i>To be determined by the WECC Regional Rating Process</i>			
Average Structure Height	125 feet (<i>single circuit</i>) 185 feet (<i>double circuit</i>)	125 feet	120 feet	135 feet
Average Span Length	1,400 feet (<i>single circuit</i>) 1,200 feet (<i>double circuit</i>)	1,400 feet	900 feet	1,400 feet
Average Number of Structures per Mile	4	4	6	4
Transmission Line Right-of-Way Width	220 feet	220 feet	150 feet	220 feet
Land Temporarily Disturbed				
	Self-Supporting Steel Lattice	Guyed V Steel Lattice	Self-Supporting Steel Tubular	Guyed Delta Steel Lattice
Structures	220 x 220 feet (1.1 acres per structure) 4.4 acres/ mile (<i>single circuit</i>) 5.5 acres/mile (<i>double circuit</i>)	220 x 220 feet (1.1 acres per structure) 4.4 acres per mile	220 x 220 feet (1.1 acres structure) 6.6 acres per mile	220 x 220 feet (1.1 acres per structure) 4.4 acres per mile
Mid-Span Conductor Splicing Sites	220 feet wide x 400 feet long One site every 18,000 feet (approximate length of two conductor reels) Average of 2 acres every 3.4 miles for hydraulic application Average of 0.5 acres every 3.4 miles for implosive application			
Pulling/Tension Sites for tangent structures	220 feet wide x 600 feet long = 3 acres per tangent structure Approximately one tangent structure every 3 miles			

Table B.2-1. Electrical Design Characteristics of the 500kV AC Transmission Line

Land Temporarily Disturbed				
Pulling/Tension Sites for strain structures	Two sites required per strain structure (assume strain structures are required where the alignment changes more than 10°) 220 feet wide x 600 feet long x two sites = 6 acres per strain structure Average 1 strain structure every 3 miles Average of 2 acres of disturbance per mile			
Material Staging Sites	800 x 825 feet (~15 acres) One site every 30 miles			
Concrete Batch Plants	3-5 acre field batch plant for sections of tubular pole construction in remote areas Ready mix concrete from retail batch plants within 35 mile haul distance Use volumetric concrete trucks where minimal amount of concrete required			
Land Permanently Required				
	Self-Supporting Steel Lattice	Guyed V Steel Lattice	Self-Supporting Steel Tubular	Guyed Delta Steel Lattice
Structures	50 x 50 feet (<i>single & double circuit</i>) 2,500 sq ft (0.05 acre) per structure 0.2 acres per mile, assuming 4 structures per mile	150 x 150 feet approximate dimension to guy anchors 22,500 sq ft (0.52 acre) per structure 2.1 acre per mile, assuming 4 structures per mile	10 x 10 feet 100 sq ft (0.002 acre) per structure 0.013 acres per mile, assuming 6 structures per mile	150 x 150 feet approximate dimension to guy anchors 22,500 sq ft (0.52 acre) per structure 2.1 acre per mile, assuming 4 structures per mile
Access Roads				
<i>Average acres per mile of transmission line by ground disturbance level (based on a 24 foot overall width which includes 2 foot berm either side of road for a 20 foot travel surface)</i>	Level 1 - Existing Improved Roads & Spur Roads		0.7 acre	
	Level 2 - Roads That Require Improvement & Spur Roads		1.7 acre	
	Level 3 - Construct Road In Flat Terrain (0 to 8%)		3.5 acres	
	Level 4 - Construct Road In Sloping Terrain (8 to 15%)		4.4 acres	
	Level 5 - Construct Road in Steep Terrain (15 to 30 %)		5.8 acres	
	Level 6 - Construct Road in Very Steep Terrain (> 30%)		8.7 acres	

Table B.2-1. Electrical Design Characteristics of the 500kV AC Transmission Line

Land Permanently Required	
Circuit Configuration	Single circuit, three conductor bundle per phase with three phases Horizontal configuration
Conductor Size	1,590 thousand circular mil (kcmil) ACSR triple bundle (1.504 inch diameter)
Max Anticipated Electric Field at Edge of Right-of-way	Guyed V and Self-Supporting Steel Lattice: 1.78kV/m Guyed Delta Steel Lattice: 0.0 kV/m Double Circuit Self-Supporting Steel Lattice: 0.50kV/m Self-Supporting Steel Tubular : 0.72kV/m
Max Anticipated Magnetic Field at Edge of Right-of-way	Guyed V and Self-Supporting Steel Lattice: 67.17mG Guyed Delta Steel Lattice: 0.0 mG Double Circuit Self-Supporting Steel Lattice: 92.57mG Self-Supporting Steel Tubular : 24.85mG
NESC Standard for Ground Clearance of Conductor	32 feet minimum at 167 °F 35 feet agricultural areas 40 feet highway and river crossings
Structure Foundations	Augured hole with reinforced concrete pier Concrete spread footing for masts. Helical anchors for guys Augured hole with reinforced concrete pier Concrete spread footing for masts. Helical anchors for guys